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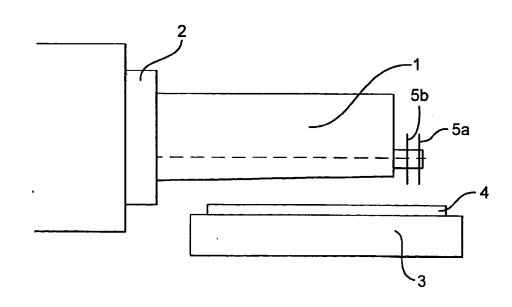
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(54) Title: MACHINING APPARATUS AND METHODS



(57) Abstract: A machining spindle comprising an inner shaft (110a) arranged for carrying a first tool (5a) for machining a work-piece and an outer shaft (110b) arranged for carrying a second tool (5b) for machining the work-piece, wherein the shafts are mounted one inside the other for rotation about a common axis and for axial movement relative to each other. The shafts are supported by air bearings. The spindle is particularly suited to dicing silicon wafers into oblong chips.

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